Big Ideas	Year 7	Year 8	Year 9 Autumn	Y9 Spring	Y9 Summer	Year 10 Autumn	Year 10 Spring	Year 10 Summer	Year 11 Autumn	Year 11 Spring	Year 11 Summer	Y12 Autumn	Y12 Spring	Y12 Summer	Y13 Autumn	Y13 Spring	Y13 Summer
Assessments	End of Each Topic and School Exam in Summer term	End of Each Topic and School Exam in Summer term	Autumn 2	February	School Exam	Autumn 1, Autumn 2	February Topic Test	School Exam: Paper 1	Autumn 1, Mock Exam Paper 1	Spring 1	, Practice Mock Paper 2	3 module tests, November Formal Assessment	Module tests	School Exam - AS Paper 1 and AS Paper 2	Module tests, November Formal Assessment	Module Tests	, Practice Mock Papers
Energy		**P2.2: Energy** Energy stores and transfers. Heat energy transfer. Energy and efficiency		**CP2: Energy** (P3.1 - P3.14)			**CP7: Energy - forces doing work,** (P8.1-8.7, P8.12-8.14) **SP5: Forces and their effects** (P9.6 - 9.9)	**CP8: Electricity** (P10.1 - 10.42)	**CP12: Forces and matter** (P12.1-15.6) SP15: Forces and matter (P15.7 - 15.17)		Revision of All	**3.2.2 Electromagnetic radiation and quantum phenomena:** Energy levels and photon emission	**3.4.1 Force, energy and momentum:** energy in collisions **3.4.2 Materials:** Bulk properties of solids	**3.4.1 Force, energy and momentum:** Work, energy and power; **3.7.1 Fields:** Force fields **3.7.2 Gravitational Fields:** Newton's law, gravitational field strength, gravitational potential, Orbits of planets and satellites	**3.6.1 Periodic motion:** Simple harmonic systems **3.8.1: Radioactivity :** mass and energy **3.7.3 Electric fields:** electric potential	**3.6.2 Thermal physics:** Thermal energy transfer, ideal gases, molecular kinetic theory model **3.9.2 Classification of stars:** Classification by temperature, black body radiation, Supernovae, netruon stars and black holes	
Waves	**P1.2: Sound** (Observed waves, sound waves, energy and waves) **P1.3: Light** (Light waves)	**P2.2: Energy** (heat energy transfer - radiation)				**CP4: Waves** (P4.1 - P4.7, P4.10, P4.17) **SP6: waves** (P4.11 - P4.16), **CP5: EM spectrum** (P5.7 P5.14, P5.20 - 5.24) **SP5: EM spectrum** (P5.1 - P5.6, P5.15 - P5.19)	**SP7: Astronomy** (P7.11 - 7.13)			Revision of All	**3.2.2 Electromagnetic radiation and quantum phenomena:** The photoelectric effect, wave particle duality	**3.3.1 Progressive and stationary waves** progressive waves, longitudinal and transverse waves, principle of superposition of waves and formation of stationary waves. **3.3.2 Refraction, diffraction and interference:** interference, diffraction, refraction at a plane surface		**3.6.1 Periodic motion:** Simple harmonic motion, simple harmonic systems, forced vibrations and resonance	**3.9.1 Telescopes:** Astronomical telescope, reflecting telescopes, single dish radio telescopes, I-R, U-V and X-ray telescopes, Advantages of large diameter telescopes **3.9.2 Classification of stars:** Classification by luminosity, classification by temperature, black body radiation, principles of the use of stellar spectral classes, supernovae, neutron stars and black holes **3.9.3 Cosmology:** Doppler effect, Hubbles law, Quasars	
Forces	**P1.1 : Forces** (Forces, balanced forces, forces (at motion) **P1.4 Space** (Space physics)	**P2.3: Motion and pressure** (Describing motion, pressure in fluids) **P2.2: Energy** (Calculation of fuel uses and costs in domestic context, energy changes and transfers, changes in systems, particle model, energy in matter)	**Equation introduction (CP1) CP1: motion** (P2.1 - 2.13)		**CP2: Forces** (P2.14 - P2.31)		**CP7: Energy - forces doing work, CP8: Forces and their effects** (P8.1-9.5) **SP7: Astronomy** (P7.1, 7.5 - 7.7)		**CP13: Forces and matter** (P12.1-15.6) **SP15: Forces and matter** (P15.7 - 15.17)	**CP10: Magnets and magnetic fields** (P12.10 - P12.13) **SP12: Magnets and magnetic fields** (P12.14)	Revision All	**3.5.1 Current Electricity** Electromotive force and internal resistance.	**3.4.1 Force, energy and momentum:** scalars and vectors, Motion along a straight line, projectile motion, moments, newtons laws of motion, momentum,	**3.6.1 Periodic motion:** circular motion	**3.6.1 Periodic motion:** simple harmonic motion **3.8.1. Radioactivity:** induced fission	**3.5.2 Thermal physics:** gas laws, kinetic theory equation (momentum) **3.9.2 Classification of stars:** Supernovae, neutron stars and black holes **3.9.3 Cosmology:** Quasars	
Fields		**P2.1: Electricity and magnetism** (Current electricity, static electricity, magnetism)					**SP7: Astronomy** (P7.5 - 7.7)	**CP8: Electricity** (P10.1 - 10.42)		**CP10: Magnets and magnetic fields** (P12.1-12.9) **CP11: Electromagnetic induction** (P13.10, P13.2, P13.5-13.6, P13.8-13.9) **SP13: Electromagnetic induction** (P13.1, 13.3-4, 13.7, 13.11)	Revision All	**3.5.1 Current Electricity** Basics of electricity, current-voltage characteristics, resistivity, circuits, potential divider, Electromotive force and internal resistance.		**3.7.1 Fields:** Force fields **3.7.2 Gravitational fields:** Newton's law, gravitational field strength, gravitational potential, Orbits of planets and satellites	**3.8.1 Radioactivity:** Nuclear radius via alpha scattering. **3.7.3 Electric fields:** Coulombs law, Electric field strength, electric potential **3.7.4 Capacitance:** Capacitance, Parallel plate capacitor, Energy stored by a capacitor, capacitor charge and discharge **3.7.5 Magnetic fields:** Magnetic flux density, moving charges in a magnetic field, magnetic flux and flux linkage, electromagnetic induction	**3.9.2 Classification of stars:** Supernovae, neutron stars and black holes **3.9.3 Cosmology:** Quasars	
Matter		**P2.1 Electricity** (static electricity) **P2.2 Energy** (particle model, energy in matter)					**CP6: Radioactivity** (P6.1 - P6.27, P6.29, P6.31, P6.32) **SP6: Radioactivity** (P6.28, P6.30 - P6.46) **SP7: Astronomy** (P7.2 - 7.4, P7.8 - 7.10, P7.14 - 7.18)		**CP12: Particle model** (P14.1-14.15) **SP14: Particle model** (P14.16 - 14.26) **CP13: Forces and matter** (P12.1-15.6) **SP15: Forces and matter** (P15.7 - 15.17)		Revision All	**3.2.1 Particles:** Constituents of the atom, stable and unstable nuclei, Particles, antiparticles and photons, Particle interactions, Classification of particles, Quarks and antiquarks, Applications of conservation laws **3.2.2 Electromagnetic radiation and quantum phenomena:** The photoelectric effect, wave-particle duality, collision of electrons with atoms	**3.4.2 Materials:** Bulk properties of solids, The young modulus		**3.8.1 Radioactivity:** Rutherford scattering, alpha, beta and gamma radiation, radioactive decay, nucleus instability, nuclear radius, mass and energy, induced fission, safety aspects	**3.6.2 Thermal physics:** SHC, SLH, Ideal gases, molecular kinetic theory model	
Chemistry	Particles, Atoms Elements and Compounds, Diffusion	Endo and Exothermic Reactions	Atomic Structure	Ions		Moles, gas volumes	Equilibrium		Endo and Exothermic Reactions, Bond Enthalpy, Fuels, Global Warming								
BIOLOGY			standard form, rearranging equations, converting units		Revous communication	Medical imaging											
Equations	Spring constant (higher ability) Density	$s=d/t$, $WD = F x d$	$s=d/t$, $a=v-u/t$, $f=ma$, $w = m x g$	Efficiency, GPE = m x g x h, KE = 1/2 x m x v2	$F=ma$	$s = d/t$, $s = f x \lambda$,		$Q = I x t$, $E = Q x v$, $V = I x R$, $E = I x V x T$, $P = E/t$, $P = I x V$, $P = I2 x R$,	$E = mc$ SHC x Δt, $E = m x$ SLH density = mass/volume, Energy - 1/2 x k x e2, $F = k x X$	$F = Bx I x L$, $V a l = V a l$, $P = I x V$							
Maths skills	direct proportion (Hookes law)	rearranging equations	standard form, rearranging equations, converting units interactive	Rearranging equations, draw and interpret sankey diagrams		Standard form	decay equations, standard form	rearranging equations, deriving units	direct proportion, rearranging equations Calculating gradients, rearranging equations, direct proportion, deriving units Inverse proportion	rearranging equations, proportional relationships							
Practicals	reflection, refraction, investigating forces, investigating friction, Hookes law,	energy in foods, heat rerefer demonstrations, building circuits, investigating strength of an electromagnet	investigating $F=ma$ (Core), investigating gravity, Measuring wave speed in water and a solid (Core)		Investigationa Newton II (core)	Investigating refraction (core) Investigating thermal energy from different srfaces (Core-SEP only)	Radioactivity demonstrations	Investigating resistance (Core), investigating series and parallel (Core)	Investigating water - SHC and SLH (Core) Density of irregular object, density of a liquid (Core) Investigating springs (Core)	Building an electromagnet, investigating magnetic Fields		**Required practical 5:** Resistivity of a wire **Required practical 6:** Interference effects	**Required practical 1:** Frequency of stationary waves **Required practical 2:** Interference effects **Required practical 4:** Measuring the Youngs modulus **Required practical 3:** Determination of g via a freefall method	**Required practical 7:** Investigation into simple harmonic motion using a mass-spring system and a simple pendulum	**Required practical 12:** Investigation of the inverse-square law for gamma radiation **Required practical:** Capacitors	**Required practical 8:** Boyles law and Charles law **Required practical:** Force on a wire **Required practical:** Flux	
Disciplinary knowledge (conceptual)	P1.1 L2 & L4 variables, interpretation of results, drawing conclusions P1.3 L3 interpretation of results, drawing conclusions	P2.1 L2/3/4 interpretation of results L7 variables, interpretation of results P2.3 L2 gradient of a graph (0-T graphs)			CP2: variables, risks/ safety, accuracy, interpretation of results, graphs, drawing conclusions	CP4: risks/ safety, accuracy CP5: interpretation of results SP5: variables, risks/ safety, accuracy, interpretation of results, graph drawing, drawing conclusions	CP6: development of theories (atomic model), evidence to draw conclusions (Rutherford)	CP8: variables, analysis of results, drawing graphs, drawing conclusions	CP12: Archimedes development of method for calculating density, accuracy, variables, risks/ safety, interpretation of results, drawing graphs, drawing conclusions		Revision of all	During Autumn 1 Y12 students complete 'Measurements and their errors' topic to cover all aspects of conceptual disciplinary knowledge. Students complete practical tasks in line with AQA guidance when the relevant substantive knowledge is being covered. Students are given adequate opportunity to consider hypotheses, variables, risks/ safety aspects, accuracy/ repeatability/ reproducibility/ validity of data, produce appropriate results tables and graphs, interpret results and draw conclusions with can then be linked back to substantive knowledge.					
Disciplinary knowledge (Procedural)	P1.1 L1 Newton meter to measure force, L2 Newton meter to measure force, ruler to measure length P1.3 L3 protractor to measure angles	P2.1 L2 building a series circuit, ammeter to measure current L3 building a series circuit, voltmeter to measure Pd L4 Building a parallel circuit L7 voltmeters and ammeters to measure Pd/ current, building an electromagnet			CP2: stop clock to measure time, light gates to measure time/ speed/ acceleration, how a light gate works	CP4: ruler to measure wavelength, stopclock to measure frequency CP5: protractor to measure angles SP5: thermometer to measure temperature		CP8: ammeter to measure current, voltmeter to measure Pd, rheostat to control current	CP12: Density: measuring volume with a measuring cylinder/ Eureka can, measuring mass with a balance, how a Eureka can works Investigating water: temperature with a thermometer/ temperature sensor. Investigating springs: ruler to measure spring length, use of set square,		Revision of all	Students complete all PAG tasks in line with when relevant substantive knowledge is being taught. All PAGs focus on students selecting and using equipment appropriately and safely. Students use the precision of the instruments to calculate uncertainties where appropriate.					
Practical skills	measuring angles, reading scales (newton meter & ruler)	Designing an investigation, variables	Estimates, approximations to a method, measurements to be made, suitable equipment, safety, minimising errors	measurements to be made, suitable equipment			Drawing and interpreting graphs, variables, minimising errors		variables, measurements to be made								
Personal development																	
British values																	
CEIAG			Astronaut - link to acceleration	Forces analyst	Aerodynamicist	CP4: Lighting designer CP5: Radiographer	CP6: Particle physicist SP7: Space scientist CP7/8: Sports engineers	CP8: Electrical engineer	SP11: Air sea rescue - discharging the helicopter CP12/SP14: Civil and structural engineering CP13/SP15: Metallurgist	CP10: Geomagnetist SP13: Sound engineer		Trip to QE hospital cancer centre - physics careers	3.4.2: Materials - Material science engineering				
SMSC				Moral: renewable/ non-renewable energy			CP6: Moral - splitting the atom can be both beneficial and harmful SP7: Cultural - historical context of attitudes towards new theories		CP12: Lake Titicaca SP11: Moral/ social - deflebrators & Fabrice Muamba/ Christian Eriksen						Moral: splitting of the atom can be both beneficial and harmful			
Extra curricular	Y7 science club											Trip to QE hospital cancer centre - physics careers					
Cultural capital			100m sprint record holders	Energy and the environment link to Greta Thunberg	Isaac Newton	CP4: Waves, energy and the boxing day Tsunami CP5: History of light	CP6: Spectroscopy, Alexander Litvinenko SP7: Galileo, Brecht and the heliocentric model CP7/8: James Watt, steam and horsepower	CP8: Galvani, electricity and Frankesteins creature	SP11: Static electricity and art - Richard Box CP12/SP14: Aiming for absolute zero CP13/SP15: Shape memory alloys	CP10: Maglev trains and rail guns SP13: Faraday		3.2.1: Particles - Rutherford, Chadwick, Thomson, Fereday, discovery of antimatter, $E=mc^2$, CERN, Dirac, hypothesising the existence of the neutrino (Pauli), blue sky research, Feynman, standard model **3.2.2 Quantum phenomena** - Max Planck, Einstein, deBroglie, Millikan, 3.5.1: Current electricity - superconductors, semiconductors, Ohm, Kirchoff, James Dewar, MRI scanners, Meissner effect		3.3.1: Progressive and stationary waves tsunamis, mexican wave, earthquakes, polarising lenses, musical instruments (trumpet, milk bottles, etc) 3.3.2: Diffraction, refraction and interference Thomas Young, peppers ghost (in theatres) 3.4.1: Forces energy and momentum Galileo, Alan Eustace/ Felix Baumgartner, turbulence (F1/ cycling), Newton, Fireworks, crumple zones, seat belts, Beamon/ Mike Powell (long jump record) 3.4.2: Materials - strength (spider silk, climbers ropes), bullet proof vests (Kevlar), Robert Hooke, aerogel		3.8.1: Radioactivity - Rutherford,		
Equality and diversity				Elijah McCoy (automatic lubrication system for locomotives)	Valentina Tereshkova	Augustin-Jean Fresnel, Caroline Herschel (when discussing her brother, William)	CP6: Lise Meitner SP7: Gladys West (Pluto and GPS) Vera Rubin, Mary Golda Ross, Benjamin Bannekar, Caroline Herschel					Chien Shiune Wu			Chien Shiune Wu	Vera Rubin, Mary Golda Ross, Caroline Herschel	